east, so the seeming preference for the willow may be owing to lack of drinking-places elsewhere.

It would be interesting to know if the other species of this genus were addicted to the same habit. Who knows?

ALVAH A. EATON.

Riverdale, Fresno County, Cal., Dec. 26.

A Peculiar Fire.

In *The Ladies' Home Journal* for January is an account of a fire from gasoline that originated in a rather peculiar manner. A lady was cleaning a Brussels carpet with gasoline. She had cleaned about one-third of the carpet when she noticed one spot that looked a little dull and which must have a little more rubbing. She says, "I gave one quick, hard rub, the cloth in my hand ignited. There was a sort of a puff, and the flames went creeping all over the carpet I had cleaned." The explanation suggested was that the friction ignited the gasoline, but no suggestion is made as to whether that was caused by raising the temperature to a high degree as might ordinarily happen by friction or whether it was otherwise.

Some of my experience in the cold, dry climate of Minnesota has suggested a very plausible explanation for this accident, which seems surprising that such accidents are not more frequent. Our sleeping-room has an ingrain carpet from which we get marked electrical experiences. On a cold morning one can hardly take a step without being strongly electrified. By shuffling across the carpet, taking only two steps, I have many times drawn a spark one-eighth of an inch long. By taking a dozen shuffling steps and touching the water faucet I have several times drawn a spark nearly one-half of an inch long. Indeed, it is so common and so excessive that it is quite uncomfortable. I have several times thought seriously of getting up some arrangement for gradually dissipating the charge on one's body, so that we can avoid the unpleasant shock when using the water. It should be stated that this high degree of electrification is not an every-day experience, but it is very common when the thermometer in the room goes below 50° or 40° Fahr.

A similar experience is very common here when one is putting on a fur overcoat or one simply with a fur collar. The simple rubbing of the fur in putting on the coat will so electrify it that one gets a prickly sensation from the charge from the collar when it is turned up against one's neck. Quite frequently simply picking up a flannel undergarment will so electrify it that one hears a decided crackling. These experiences are very common here in Minnesota with the dry atmosphere, and are quite surprising to one accustomed to the more moist climate of New York of the sea-coast.

This experience suggests at once that the gasoline in the case above noted was ignited by an electric spark caused by rubbing the carpet.

G. D. SHEPARDSON.

University of Minn., Minneapolis, Minn.

Electrical Phenomena on Mountains.

THE experience of Mr. Chariton and the relation of Mr. Stone, as given in *Science* Sept. 23 and Dec. 2, have a parallel in the account of a traveller in Italy in 1814, who is quoted in the volume of Inne's Telescope for 1827, under the heading of "Curious Effects of Electricity upon Mount Ætna," and from which I extract as under.

"June 2, 1814. Before midday two travellers were returning from the mountain, guided by Vicenza Carbonaro, one of the guides from Nicolesi. They had arrived in the Piano del Huga, when, expecting a hail-storm, they quickened their pace. Walking on frozen snow, Carbonaro was the most advanced of the party, he felt his hair stand on end, his forehead and the skin of his face felt benumbed, and he heard a hissing noise. He took off his cap and his hair became more bristled, and the whistling noise more powerful The traveller nearest to Carbonaro also heard a humming sound, and asked the guide what it was; he could not give any reason for it, and he stopped, supposing he was dizzy. In the meantime they approached each other and were pleased with the magic sound. The traveller turned to call his companion, who was at a little distance, and made a sign to him with his hand, the hand when raised produced a much stronger sound, so much so, that moving the fingers singularly modulated it. The traveller approached and heard the sound produced by the head and body of his companion, but, not having entered the current of electric air, his repeated attempts produced no sound. Finally, the three persons having joined, they experienced great pleasure, as with moving their fingers they produced the above extraordinary effect. In the meantime the hail-storm fell on them, and, being rather curious than erudite, they resolved to prosecute their journey downwards, without caring to make further investigation. Scarcely had they gone a few paces, advancing beyond the electric air, than the sounds ceased."

GEO. CLULOW.

51 Belsize Avenue, Hampstead, N.W., London, Jan 2.

Maya Codices.

As the controversy between Dr. Seler and myself has drifted into mere criticisms of each others' statements, and no serious attempt to test my interpretations or to show that they are incorrect has been made, I think a continuance on this line would be unprofitable. I therefore close it, on my part, by suggesting to students of the Maya Codices that it might be worth the trouble to test my interpretations by an attempt to apply them in deciphering other combinations. I also call Dr. Seler's attention to the fact, that, notwithstanding his firm belief to the contrary, there is a numeral designation with a cross *between* the dots in the bottom line of Dres. 46,—2 *Kayab*. Moreover, it is precisely of the form shown in his Figs. 17, 19, and 20, *Science*, Jan. 6, 1893.

CYRUS THOMAS.

Washington, D.C., Jan, 16.

BOOK-REVIEWS.

Experimental Evolution. By HENRY de VARIGNY. London and New York, Macmillan & Co. $1.50.

THROUGHOUT the whole line of biological research the progress of advance has been from statical to dynamical science. The first study is always a study of facts of nature as they exist, of their relations to each other and of their history. Later follows the study of nature in motion accompanied by experimental work and an endeavor to modify the activities of nature. Already biologists have inaugurated the science of experimental evolution, and this book by De Varigny is designed to start biologists to the study of a new science which the author calls experimental evolution. This work consists of a series of lectures originally delivered by the author before the Summer School of Art and Science at Edinburgh. The author points out that while the various lines of biological research, embryological, paleontological and morphological, all point in the direction of evolutionary theory, they fail to be conclusive demonstrations of evolution, because no one of them shows us the process of evolution in action. Evolution is an inference from the facts, but not a demonstrated truth. There is needed as a final test experimental study in regard to the production of new species by process of nature. To the discussion of the possibility of this branch of experimentation, these lectures are devoted. The author first summarizes, in an extremely interesting fashion, the chief lines of fact which have been collected in connection with variations of animals in nature. Second, in a similar way, he summarizes and discusses variations which are known in animals under domestication. Third, he endeavors to show how these variations are under the influence of conditions; conditions of environment, conditions of heredity, conditions of interbreeding, etc.; and, last, he tries to point out how it may be possible in the future for the experimenter so to regulate these conditions of environment as to cause at will actual changes to take place in the structure and characteristics of animals and plants which may result in the not too greatly distant future in the production of new species and hence in the final demonstration of a doctrine of evolution. Although largely a compilation the work is withal interspersed with many new and interesting observations made by the author in connection with the subjects discussed, the changes in the structure and

characteristics of animals brought about by the changes in conditions surrounding them. The series of lectures is extremely interesting and suggestive. It will be found to contain a most excellent summary of the important facts known in regard to variations and the conditions regulating variations in animals and plants, and it will also be found to be full of suggestions to guide further experiments in the future. The work perhaps shows some trace of lack of sufficient care and occasionally carelessness in quotations from the authors cited, but on the whole we must regard these lectures as an extremely valuable addition to our knowledge of the doctrine of evolution and possibly as a stepping-stone into a new department of investigation upon the doctrine of evolution. Especially important are they as opening a new field of research, which is so broad and yet so close at hand that there is opportunity for all to work therein with strong confidence in being able to obtain valuable results.

Text-Book of Elementary Biology. By H. J. CAMPBELL, M.D. London and New York, Macmillan & Co. $1.60.

THE last few years have seen the publication of several books on elementary biology, and those already published very satisfactorily fill the need felt by schools for such works. One can but wonder at the appearance of this new book by Dr. Campbell, especially when we see that it covers practically the same ground as some of the others and in no more satisfactory a manner. The book is entitled Introduction to the Study of Elementary Biology, but it certainly could never be used as such unless it were accompanied by a long course of lectures or by considerable assistance in practical work. The text is too condensed, the subject too crowded and everything is treated in too concise a manner to be intelligible to a student who is beginning to study elementary biology. In some places the text is scarcely more than a catalogue of anatomical details perfectly unintelligible without a large amount of outside assistance. The book is divided into two parts, the first giving general biological truths and the second giving more detailed descriptions of a few types. The author advises the student to read the two parts together and not consecutively, a precedure which most students would be sure not to follow. The author also strongly advises a student to do a considerable amount of practical work in connection with the reading, but nowhere in the book does he give any directions for such practical laboratory work, any directions for obtaining material or for using it, so that a student would be utterly unable to work in the laboratory by the use of this book alone. In short, the book as an introduction is impracticable unless it is accompanied by considerable personal direction on the part of instructors. Seemingly this book is designed chiefly for medical students, or at least so one would judge from the apportionment of space allowed to types. Of 160 pages which are devoted to types, over 55 are taken by the study of parasitic worms including leeches, 31 more with the unicellular organisms, leaving less than 30 pages for all the rest of the animal kingdom, including invertebrates; perhaps the most curious apportionment of space to be found in any text-book. While for an elementary text-book it seems to be not usable, the work does contain an interesting summary of biological principles and facts which would be instructive and pleasant reading to a person already acquainted with elementary biology and wanting an outline summary of leading biological principles. For such a purpose the book many be recommended, and will be found readable and instructive.

Physics. Advanced Course. By GEORGE F. BARKER, Professor of Physics in the University of Pennsylvania. American Science Series. New York, Henry Holt & Co. 902 p. 8°.

THIS addition to the excellent series of scientific text-books published by Messrs. Henry Holt & Co. will be welcomed by teachers of physics both on account of Professor Barker's reputation as a teacher and as an investigator.

In the preface the author states that the progress which has been made in physical science within the past decade has com-

CALENDAR OF SOCIETIES.

Chemical Society, Washington.

Dec. 8.—Subject of Discussion, National Chemical Society Plans.

Jan. 12.—Ninth Annual Meeting. Officers elected: President, Dr. F. P. Dewey; vice-presidents, Mr. Cabell Whitehead, Mr. K. P. McElroy; treasurer, Dr. E. A. de Schweinitz; secretary, Dr. A. C. Peale; additional members of executive committee, Professor H. W. Wiley, Professor F. W. Clarke, Dr. Thomas Chatard, and Professor R. H. Warder. Papers were read as follows: On Some Old Vegetable and Animal Oils, by K. P. McElroy and W. D. Bigelow. An examination had been made of thirteen oils that had formed part of the exhibit at the Centennial Exposition of 1876, with the view of determining the effect of age. The conclusion reached was that age diminishes the iodine number of oils and fats but increases the ether and free acid members. On Some Problems of Physical Chemistry, by Robert B. Warder, who submitted the following as some of the open problems. 1. What is the real nature of matter in atoms and in molecules, in elements and compounds, and in the several states of aggregation? 2. How far can the properties of each kind of matter be exposed as a function of the atoms (or other constituents) of which it is composed? 3. What are the mechanical possibilities and limitations of chemical change? Subject discussed, What May We Hope to Gain from the Congress of Chemistry at Chicago Next August.

New York Academy of Sciences, Biological Section.

Jan. 9.—A. A. Julien, Suggestions in Microscopical Technique, including (*a*) a carrier of cover impressions (mycoderm blood), utilizing as clamps a coil of brass wire moulded in a phial. The same device with a platinum coil serves as a convenient staining phial for cover-glass preparations. (*b*) A suggested medium for mounting delicately intractile protoplasmic objects. (*c*) Devices for avoiding inclusion of air-bubbles in mounts. (*d*) Balsam-paraffine as a ring varnish. O. S. Strong, On the Components of Cranial Nerves of Amphibia. In the seventh a dorsal root was shown to pass off into brain, representing Ophthalmicus, Superficialis, Facialis, and Buccalis of fishes, and innervating the lateral sense-organs of the head. In vagus a root of similar internal origin passes into the R. laterales, innervating the lateral sense-organs of the body. Another component of the facialis is the fascicalus communies of Osborn, which was believed to represent the lobus vagi of fishes. This passes off into the palatinus and mandibulaies internus, innervating the mucous epithelium of the oral cavity; while in the glosso-phangugrus and vagus similar components derived from this fasciculus innervate in like manner portions of the alimentary canal and its appendages. The relation of the results to segmentation of head was discussed. N. L. Britton, A Review of the N. A. Species of Lespedeza, With Comments on the Eleven Native Species, Shown to be Divisible into Two Groups, (*a*) those producing both petalous and apetalous flowers, and (*b*) those in which the petalous flowers are developed. Of the two naturalized species, one, in the south-eastern part the United States, L. striata (shrug) H. and A., is a native of eastern Asia, appearing (about 1848) in Georgia.

Society of Natural History, Boston.

Jan. 18—W. M. Davis and students in geological field-work in Harvard University, Report on a Study of Glacial Sand-Plains in Eastern Massachusetts (illustrated by lantern slides).

Society for the Advancement of Science, Las Cruces, N.M.

Jan. 12.—C. H. Tyler Townsend, Presiden's Annual Address: The Present Status of Science in New Mexico.